

# Crime Investigation System

Modhale Pallavi<sup>1</sup>, Kshirsagar Amruta<sup>2</sup>, Suryavanshi Arti<sup>3</sup>

Department of Computer Engineering  
H.S.B.P.V.T College of Engineering, Kashti

**Abstract**— In this paper a criminal detection agenda that could help police to know the face of a criminal or a suspicious is planned. The agenda is a client-server video based face recognition investigation in the actual. The agenda smears face detection and tracking using Android mobile devices at the client side and video based face recognition at the server side. This paper attentions on the growth of the client side of the future agenda, face detection and tracking using Android mobile devices. For the face detection phase, strong Viola-Jones algorithm that is used. The face tracking phase is founded on Optical Flow algorithm. Optical Flow is applied in the future agenda with two feature extraction methods, Fast Corner Features, and Regular Features.

## I. INTRODUCTION

Computer revelation emphases on repetition or imitation of human visualization. Therefore, it includes many methods that used to obtain, procedure, examine, and recognize images, and it uses a camera to analyze and understand acts in the real world. Human face is the maximum thing got the attention of the investigators because of the numerous critical applications associated to the human face reaching from shadowing systems to acting applications.

Face detection achieves a real-time performance through Viola-Jones framework where its detection rates are competitive with some of the best methods to date in terms of both performance and running time. Face tracking provides a solution to handle the real-time conditions and video attributes as a temporal continuity attribute but the time consuming of the most tracking algorithms makes tracking problem an open area of research. The recent research seeks to take a benefit of AdaBoost approach to set an initial window of a target object for a tracking method. Then, the tracking method is responsible for tracking the face by distinctive features, but in a fast manner optical flow is used.

To track objects, it is an adaptive algorithm based on the result of the previous frame. Optical flow method gets current key points and a homography transformation between the previous and the current frames

In the technical context, Android developers tend to support Android mobile devices by biometric applications including face tracking. Face tracking using a hand-held camera of a mobile device must consider both the motion of the camera and the face object, and must be able relatively to handle the blurring resulting from shaking or significant displacement of the face to keep the tracking accuracy as high as possible. In addition, mobile devices also have many limitations in hardware resources like computing resources. These limitations make tracking problem on mobile devices an open area of research. Android platform has the ability to get benefits of Open Computer Vision library. It is a programming library mainly aimed a real-time computer vision. OpenCV provides Viola-Jones detector for detecting multiple faces under the real-time conditions.

In this paper a criminal detection framework is proposed. This framework, as shown in fig. 1, is a client-server video based face recognition surveillance in the real-time. The framework scenario is as following: the policeman capture a video for a criminal or a suspect using his Smartphone camera, a real time face detection and tracking is done at the client side. Then the video frames containing the detected and tracked face are sent to the server where a video based face recognition is done at the server side. The personal information record for the recognized person is sent back from the server to the policeman mobile phone. This paper focuses on the development of the face detect-track system on Android platform at the client side. The face detection stage uses Viola-Jones detector supported by OpenCV. The face tracking stage is based on Optical Flow algorithm, which is implemented using java. The performance of the proposed face detect-track system is compared using two feature extraction methods, Fast Corner Features, and Regular Features with Optical Flow algorithm.

## II. Criminal Details

In this project we are submit total information about the criminal like Criminal id, Criminal Name, Alias Name, Date of birth, age, gender, Address, Date of Arrest, Registration date and Status.

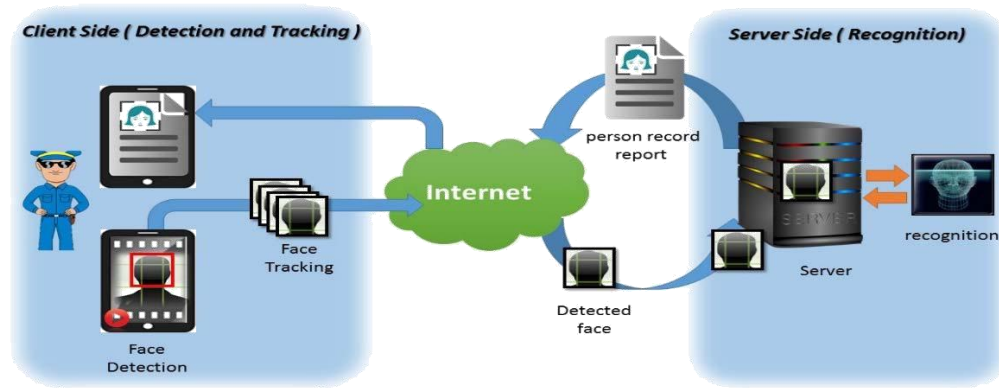


Fig. 1. The Proposed Client-Server Criminal Detection Framework

In Status we can include three types like first case pending, second case closed and third case cancel. In the closed case a criminal conviction may be imposed.

And in pending case the criminal may be observed or the court has not taken action.

In this form another two option are present first is criminal list and another is face details. In criminal list criminal id and his crime name and crime details with low number all information included in details. And criminal face details included criminal face information like Hair, Eyes color, Nose, Lips, Chin, Cheeks, etc. this information helps to detection of criminal face.

### III. Criminal report

In Criminal report it has the facility of generating a report of all its information after entering the criminal id. Criminal report helps to find criminal all details information like his name, address, crime list, suspects, and added cases like all information.

Report are generated in pdf file format, police will take hard copy of report with the help of printer.

### IV. Security

Login page are used for security purpose and also used mysql server. In Login page there are two logins first is admin login and second is officer login , admin login handle the internal settings of software and officer login handles the officers data like which case are investigate of particular officer and etc information.

This is an advanced system allows crime investigation team working from various city's or various state for a particular case to work on the case together by sharing evidence and also the progress o the particular case and one more important feature of project is also predict who are the real criminal behind the crime so based on the case evidence.

It provide the percentage of how much system predict a particular Pearson or suspect.

In this system two login are there and in login number of modules are present. Like as in Admin module add case module, add officer module, Add case Officer module, predict result module, view result module, view evidence module, view case history module etc.

In add officer module all the personal details of that officer are added like his name, name, address, officer id, etc. And add the image of that officer in the form. And submit from adding all details off officer into the server.

Add case module add or register the new case fill the from like case id case ID is important for the case , then we can case name like murder, and allocate officer to particular case and add the officer mailed , then system sends the mail to that officer new case is register on our under. And add one note in the form like child was killed etc. And add submit all the details send into the server.

### V. Officer Details

In this system for officers information provide the add officer and add case officer from. In that from officer Id and other details of officer, if the any particular case officer is change then new officer apply to that case.

If new Officer add successful then system send mail to that officer and in the mail new Case information and case Login like username and Password is send this username and password is unique for all the cases .This username and password technique provide security to the system, no any office can access other case information without that case officer permission.

Then Predict Result model is given in this module predict the result of particular case. This result is provided in basis of suspects and evidence of that case. Officer just add the Case Id and all details of suspects and Evidence are display on the screen.

Case ID :- 10001

Case ID	Name	Mobile No	Address	Relation	Date	Rank	Note
10001	House Keeper	9076613247	Malad	House Keeper	23-07-15	14	New house keeper
10001	PQR	9076613216	asdasdas. malad	Wife	22-07-15	11	Many fights
10001	ABC	9076613214	asdasdas. malad	Patner	20-07-15	10	dfjksdsjdfsndjfs



Name :- House Keeper  
Mobile :- 9076613247

Physical Score:- 9/10  
Logical Score :- 5/10

Probability :- 70%



Name :- PQR  
Mobile :- 9076613216

Physical Score:- 0/10  
Logical Score :- 5/10

Probability :- 55%



Name :- ABC  
Mobile :- 9076613214

Physical Score:- 4/10  
Logical Score :- 6/10

Probability :- 50%

Fig :- Suspects Probability points

In View Suspect module all suspect information are added like in that add suspect name , address mobile number, Physical Evidence and logical Evidence are present and this physical and logical evidence pointer calculate the probability points, this points shows the who are the real criminal of the particular case.

**A. Physical Evidence**

In the Physical evidence suspect presence on the crime location or the suspect mobile number location tract on that location in the crime time and like that the crime location gun are found and this gun match the suspect figure print. That's like the physical Evidences. And This points are added like 9/10 in that way, if the gun figure print are match then it will goes 10 out of 9/10 points.

**B. Logical Evidence**

In the Logical evidence like suspect gives money for other. Suppose son murder the father then logical evidence is for property issue. In that way logical evidence are add and logical evidence points added like physical evidence. And finally the physical and logical evidence calculate the probability in the percentage and this percentage shows who are real criminal in that particular case. The suspect logical and physical evidences points and that calculated probability point are shows in the above fig.

We here propose a criminal investigation tracker system that tracks the investigation status of criminal cases with logs and also predicts primary suspects. The system is proposed to help agencies like CBI, CID and other such bureau's to speed up investigation process and track status of multiple cases at a time. The system keeps logs of a case which includes case summary, people involved, disputes, past criminal history of those involved, Items recovered on scene and other details. The system realizes the type of case, allows admin to update the status of investigation, upload more images of crime, items found on scene etc.

This allows authorized officers to check case status and look into its status online and also update any important info as and when needed. The system also consists of a suspect prediction algorithm. Based on type of case, property, land, love or other entities involved the system studies past cases, it studies past criminal records of those involved and based on this data it provides suggestions of suspected persons in a logical order. The system is designed to aid investigation teams to work collectively on cases, coordinate and also speed up the process by suggesting logical suspects based on data provided.

## REFERENCES

- [1] R. Klette, Concise Computer Vision, Springer London, 2014.
- [2] P. VIOLA and M. JONES, "Robust Real-Time Face Detection," *International Journal of Computer Vision*, vol. 57, no. 2, pp. 137-154, 2004.
- [3] A. Ranftl, "Face Tracking Using Optical Flow," Halmstad University, Halmstad, 2014.
- [4] L. Montanini, E. Cippitelli, S. Spinsante and E. Gambi , "Low complexity head tracking on portable android devices for real time message composition," *Journal on Multimodal User Interfaces*, vol. 9, no. 2, pp. 141-151, 2015.
- [5] V. Q. Nhat, S.-H. Kim, J. H. Yang and G. Lee, "Real-time Face Tracking with Instability using a Feature-based Adaptive Model," *International Journal of Control, Automatin and Systems*, vol. 13, no. 3, pp. 725-732, 2015.
- [6] Qi, Cao; Ruishan, Liu;, "Mobile Computer Vision," 8 Jun 2015. [Online]. Available: <http://web.stanford.edu/class/cs231m>. [Accessed 8 December 2016].
- [7] "OpenCV | OpenCV", *Opencv.org*, 2017. [Online]. Available: <http://opencv.org/>. [Accessed: 09- Sep- 2015].
- [8] Viraj, M. Pradip, T. Pankaj and M. hweta, "Criminal Detection Using Eigenfaces Approach on Android Device," *International Journal of Computer Science and Information Technologies*, vol. VI, no. 1, pp. 539-541, 2015.
- [9] M. Prathamesh, R. Vedant, M. Suraj, K. Avinash and S.V.Wankhade, "Criminal Tracking System using CCTV," *Imperial Journal of Interdisciplinary Research*, vol. II, no. 7, pp. 206-208, 2016.
- [10] J. L. a. K. W. Lei Xu, "REAL-TIME AND MULTI-VIEW FACE TRACKING ON MOBILE PLATFORM," in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Prague, pp. 1485-1488, 2011.
- [11] M. R. N. K. L. E. Jianfeng Ren, "Real-Time Head Pose Estimation on Mobile Platforms," *SYSTEMICS, CYBERNETICS AND INFORMATICS*, vol. 8, no. 3, pp. 56-62, 2010.
- [12] G. Divya and J. Arunkant, "FACE DETECTION AND TRACKING AT DIFFERENT ANGLES IN VIDEO," *ARNP Journal of Engineering and Applied Sciences* , vol. 10, no. 17, pp. 7678-7683, 2015.
- [13] R. Andreas, A.-F. Fernando and K. Stefan, "Face Tracking Using Optical Flow," in International Conference of the Biometrics Special Interest Group (BIOSIG), Darmstadt, pp. 1-5, doi. 10.1109/BIOSIG.2015.7314604, 2015.